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SUBSTITUTE SPECIFICATION (CLEAN VERSION)

TITLE OF THE INVENTION

FFT OPERATING APPARATUS OF PROGRAMMABLE PROCESSORS AND OPERATION
METHOD THEREOF

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of Korean Patent Application No. 2002-78393 filed December 10, 2003, in the Korean Intellectual Property Office, the disclosure of which is incorporated herein by reference.

BACKGROUND

1. Field of the invention

[0002] The present invention relates to a fast Fourier transform (FFT) operating apparatus and an operation method thereof. More particularly, in a programmable processor used with a variety of standards and enabling processing of high speed telecommunication algorithms in a real-time basis and also guaranteeing flexibility in system design, the present invention relates to an FFT operating apparatus and a method thereof for carrying out FFT operation which is the kernel function of DMT (Discrete MultiTone) and OFDM (Orthogonal Frequency Division Multiplexing) modems.

2. Description of the Related Art

[0003] Generally, fast Fourier transform (FFT) are used in a variety of fields of communication systems such as with an asymmetric digital subscriber line (ADSL), wireless asynchronous transfer mode (ATM), a short distance wireless communication network, and applications such as a matched filter, spectrum analysis, and a radar. The FFT is required for the establishment of OFDM, i.e., the next-generation high speed telecommunication algorithm. The FFT is the algorithm that transforms a signal in a time domain into a signal in a frequency domain. Since the FFT significantly reduces the number of operations required for a Discrete Fourier Transform (DFT) by using the periodicity of trigonometric functions, operations are carried out with increased efficiency. The DFT is expressed by the following formula 1: